

AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions and listings of claims in the application.

LISTING OF CLAIMS

1. (Original) A detection apparatus for detecting a droplet discharged from a discharge nozzle provided in a discharge head, comprising:
 - a light emitter for emitting a detection light;
 - a receiver for receiving said detection light; and
 - a moving device for moving said discharge head in a direction to intersect the optical path of said detection light, said moving device moving said discharge head in said direction of movement, said discharge nozzle discharging said droplets at a predetermined time interval, and when
 - D is the diameter of a beam of said detection light,
 - d is the diameter of said droplets,
 - L is the distance between the discharge nozzles in the direction of movement of said discharge head, and
 - H is the relative distance that said discharge head and said detection apparatus move from when a discharge nozzle discharges one droplet to when said discharge nozzle discharges the next droplet,
 - settings are adjusted so as to satisfy the conditions
- D/2 + d/2 ≤ L , and H ≤ D.

2. (Original) A detection apparatus according to claim 1, wherein in a case where the diameter of the beam of said detection light is greater than the diameter of a measurement region of said receiver, D is the diameter of said measurement region.

3. (Original) A detection apparatus according to claim 1, further comprising a control device for resetting at least one of the values of said D, d and H.

4. (Original) A detection apparatus according to claim 1, wherein the number of said discharge nozzles can be optionally set.

5. (Original) A detecting method for a droplet discharge apparatus having a discharge head with a plurality of discharge nozzles for discharging droplets, comprising the steps of:

emitting a detection light toward a predetermined receiver;
discharging said droplets from said discharge nozzles at a predetermined time interval;

detecting the amount of light received by said receiver due to said droplets passing through the optical path of said detection light; and

when verifying the discharge state of the discharge nozzles based on the detected result, adjusting settings so as to satisfy the conditions

$$D/2 + d/2 \leq L, \text{ and } H \leq D, \text{ where}$$

D is the diameter of the beam of said detection light,

d is the diameter of said droplets,

L is the distance between the discharge nozzles in the direction of movement of said discharge head, and

H is the distance that said discharge head moves from when a discharge nozzle discharges one droplet to when said discharge nozzle discharges the next droplet.

6. (Original) A droplet discharge apparatus comprising:

a discharge head with a plurality of discharge nozzles for discharging droplets arranged side by side in a predetermined direction;

a detection apparatus for detecting whether said droplets are discharged from said discharge nozzles; and

a control unit for performing predetermined processing for said discharge head based on the detection result of said detection apparatus,

wherein said detection apparatus comprising:

a light emitter for emitting a detection light;

a receiver for receiving said detection light from said light emitter; and

a moving device for moving said discharge head in a direction to intersect the optical path of said detection light, wherein said moving device moving said discharge head in said direction of movement, said discharge nozzle discharging said droplets at a predetermined time interval, and when

D is the diameter of a beam of said detection light,

d is the diameter of said droplets,

L is the distance between the discharge nozzles in the direction of movement of said discharge head, and

H is the relative distance that said discharge head and said detection apparatus move from when a discharge nozzle discharges one droplet to when said discharge nozzle discharges the next droplet,

settings are adjusted so as to satisfy the conditions

$$D/2 + d/2 \leq L, \text{ and } H \leq D.$$

7. (Original) A droplet discharge apparatus according to claim 6, wherein the number of said discharge nozzles can be optionally set.

8. (Original) A droplet discharge method comprising:

a step for discharging droplets from a discharge head with a plurality of discharge nozzles for discharging droplets arranged side by side in a predetermined direction;

a detection step for detecting whether said droplets are discharged from said discharge nozzles; and

a processing step for performing predetermined processing for said discharge head based on a detection result of said detection step,

wherein said detection step comprising the steps of:

radiating a detection light toward a predetermined receiver;

discharging said droplets from said discharge nozzles at a predetermined time interval;

detecting the amount of light received in said receiver due to said droplets passing through the optical path of said detection light, and when verifying the discharge state of the discharge nozzles based on the detected result, adjusting settings so as to satisfy the conditions

$D/2 + d/2 \leq L$, and $H \leq D$, where

D is the diameter of the beam of said detection light,

d is the diameter of said droplets,

L is the distance between the discharge nozzles in the direction of movement of said discharge head, and

H is the distance that said discharge head moves from when a discharge nozzle discharges one droplet to when said discharge nozzle discharges the next droplet.

9. (Cancelled)

10. (Cancelled)